

FLUSHING BAY, NEW YORK.

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LETTER

FROM

THE ACTING SECRETARY OF WAR,

TRANSMITTING,

WITH A LETTER FROM THE CHIEF OF ENGINEERS, REPORTS OF  
EXAMINATION AND SURVEY OF FLUSHING BAY, NEW YORK.

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DECEMBER 12, 1904.—Referred to the Committee on Rivers and Harbors and ordered  
to be printed with map.

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WAR DEPARTMENT,  
*Washington, December 12, 1904.*

SIR: I have the honor to transmit herewith a letter from the Chief of Engineers, United States Army, dated 10th instant, together with copies of reports by Col. S. M. Mansfield and Col. Amos Stickney, Corps of Engineers, dated January 31, 1903, and June 21, 1904, of a preliminary examination and survey, respectively, of Flushing Bay, New York, made by them in compliance with the provisions of the river and harbor act approved June 13, 1902.

Very respectfully,

ROBERT SHAW OLIVER,  
*Acting Secretary of War.*

THE SPEAKER OF THE HOUSE OF REPRESENTATIVES.

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WAR DEPARTMENT,  
OFFICE OF THE CHIEF OF ENGINEERS,  
*Washington, December 10, 1904.*

SIR: I have the honor to submit herewith, for transmission to Congress, reports dated January 31, 1903, by Col. S. M. Mansfield, Corps of Engineers, and June 21, 1904, by Col. Amos Stickney, Corps of Engineers, upon preliminary examination and survey, respectively, authorized by the river and harbor act approved June 13, 1902, of Flushing Bay, New York, "with a view to repairing, completing, or

removing the dike in said bay and extending the channel to Ireland [Ireland] Mills."

These reports have been referred for consideration by the Board of Engineers for Rivers and Harbors, as required by law, and attention is respectfully invited to the Board's report of the 1st instant in tenth indorsement herewith, which concludes as follows:

After careful consideration the Board has arrived at the following conclusions:

The extension of the existing improvement to Ireland Mills does not seem to be warranted either by present or prospective demands of commerce. The Board, however, is of the opinion that the projected 6-foot channel can advantageously be extended from the Broadway Bridge to the Main Street Bridge, though with a width of 100 feet instead of 200 feet between the bridges.

As to the dike, a study of the soundings and experience at other places tend to show that, except possibly at its inner (shore) end, it is not an essential part of the improvement. It does not appear, however, that at the present time the dike is a serious menace to navigation, and the Board therefore recommends that it be left as it is until it can be seen from further developments whether that part of the channel along the dike is maintained any better than that portion of the channel beyond the dike, and that then it be removed or repaired and extended, as developments may indicate best.

In view of what precedes, the Board recommends as desirable the further improvement of Flushing Bay, New York, by the United States, in accordance with a modified project which shall provide for a channel 200 feet wide and 6 feet deep at low water, from Long Island Sound to the Broadway Bridge, and for a channel of the same depth and 100 feet wide from the Broadway Bridge to the Main Street Bridge, by means of dredging, at an estimated cost of \$23,857.90, and that no work toward repairing, completing, or removing the dike be undertaken at present.

I concur in the views and recommendations of the Board.

Very respectfully,

A. MACKENZIE,

*Brig. Gen., Chief of Engineers, U. S. Army.*

Hon. WM. H. TAFT,

*Secretary of War.*

# PRELIMINARY EXAMINATION OF FLUSHING BAY, NEW YORK.

UNITED STATES ENGINEER OFFICE,  
*New York City, January 31, 1903.*

GENERAL: Pursuant to instructions contained in Department letter of June 23, 1902, I have the honor to submit herewith the following report on a preliminary examination of "Flushing Bay, with a view to repairing, completing, or removing the dike in said bay and extending the channel to Ireland Mills."

Flushing Bay is on the north shore of Long Island, about 14 miles by water from the Battery, New York City. It is about 1 mile wide and 2 miles long. The bottom is of soft mud, nearly level, the depth in the original channel being not much greater than elsewhere. The town of Flushing is on the east bank of Flushing Creek, just above the head of the bay. In 1861 a depth of 5 feet at low water was reported in the channel leading up to Flushing. A map of Flushing Bay is printed in the Report of the Chief of Engineers for 1889, page 732.

Flushing Creek is a small tidal stream extending southwardly from Flushing Bay, and navigable at high tide for about 2 miles from the head of the bay. Ireland Mills is situated on this creek about 6,000

feet from its mouth. Four bridges cross this creek—first, the Flushing Bridge, near the bay; second and third, bridges of the Long Island Railroad, and, fourth, Strong's Causeway Bridge, situated about 2 miles above the lower bridge. All the bridges are provided with draws, with a least clear opening of 30 feet, and navigation at high tide extends to a point just above Strong's Causeway Bridge. The first three bridges are between the mouth of the creek and Inland Mills.

The original project for improving Flushing Bay, adopted in 1879, provided for the building of 16,700 feet of diking to create a tidal basin intended to fill and discharge through the main channel, thus maintaining a least channel depth of 6 feet, mean low water, after once dredging. Estimated cost, \$173,500. The project was modified in 1888, omitting part of the diking, and again in 1891, limiting the same to one dike on the west side of the channel 4,663 feet long, besides dredging and maintaining a channel 6 feet deep, mean low water, up to the lower bridge at Flushing. The mean rise of the tide is 7.1 feet, thus making a navigable channel at high water of about 13 feet.

Work under this project began in 1879, and covered the construction of 3,057 linear feet of dike at the head of the bay. As much opposition to the project was manifested, particularly by the residents and property owners on the west side of the bay, further work on the dike was suspended until 1889, when it was repaired and extended 1,606 linear feet, making its total length 4,663 feet. Appropriations made in the mean time were expended in making and maintaining a channel of the required dimensions by means of dredging.

In 1890 petitions were sent to the Secretary of War protesting against further work on the dike and against the dumping of dredged material in the bay west of the same, in consequence of which, and upon the recommendation of Col. D. C. Houston, Corps of Engineers, June 8, 1891, the project was modified, and all subsequent appropriations were expended toward maintaining the channel by dredging. See Report of the Chief of Engineers for 1892, page 723.

On June 30, 1901, the dike, which had cost about \$33,000 to construct, was in poor condition, and since then the outer part, 1,606 feet long, left partly completed in 1891, has been nearly destroyed by storm and ice. A small light at the outer (north) end of the dike, maintained by the Light-House Department, prevents the dike in its present condition from being a serious menace to local navigation. The dredged channel, carried to a depth of 9 feet in order to secure 6 feet, was in good condition and had an available depth at that time of over 6 feet, but it was less than the projected width. The total amount expended in dredging is about \$90,000.

Colonel Houston, in report dated September 5, 1888, says:

Independent of the local opposition, I am doubtful of the effect of the proposed tidal basin; it is not certain that the ebb current will follow the line of the desired channel.

He was of the opinion at that time that the removal of the dike was unnecessary.

On August 13, 1900, Maj. E. H. Ruffner, Corps of Engineers, submitted a report<sup>a</sup> on the utility of this improvement, to which attention is invited.

Since the improvement of Flushing Bay was commenced, the limits

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<sup>a</sup> Not printed.

of New York City have been extended so as to include the bay, and a park is projected on its west shore. It would seem that the riparian owners on that shore should have the same use of the improved channel as those on the east shore and have a free and unobstructed passage to any part on the west shore. This would be impossible with a dike extending through the bay having a channel only on one side of it. The maintenance of a light is an expense which will be done away with on the removal of the dike and navigation will be benefited by having the bay open and unobstructed.

It is estimated that the cost of removing the present dike will be somewhere between \$10,000 and \$12,000. The unappropriated balance of the original estimated cost of the improvement is \$50,500, which would probably be sufficient to remove the dike and maintain a channel 6 feet in depth and of sufficient width for the next twenty years.

Experience from the attempts to improve the channels in Huntington Harbor and in Canarsie channel, Jamaica Bay, favors the improvement of broad, open, tidal bays or harbors by making and maintaining channels therein by dredging, and that dikes are of questionable utility.

From the above consideration it is recommended that the incomplete, dilapidated, and virtually abandoned dike in Flushing Bay be removed so as to leave the bay free and unobstructed, the part to be removed first being the outer or north portion, 1,606 feet long, which was left partly completed in 1891, and which has since been nearly destroyed by storms and ice.

The question as to extending the improvement up Flushing Creek to Irland Mills has not before been considered, and all work heretofore done has been confined to the channel through the bay up to the first bridge across the creek. Inquiries recently made by this office have developed the fact that considerable commerce passes up the creek, amounting to about 69,250 tons yearly, carried in vessels which draw when loaded 14 feet. These vessels can only navigate at extreme high tide. Docks have been erected along the creek between the lower bridge and Irland Mills by dealers in coal, lumber, feed, and grain. Four of these docks are now in use above the bridge.

The river and harbor act of June 13, 1902, contained an appropriation of \$39,500 for "improving harbors at Port Jefferson, Huntington, Glencove, Flushing Bay, Canarsie Bay, and Sag Harbor, New York, of which \$2,000 was allotted to Flushing Bay. A project for the expenditure of this amount was submitted by this office July 14, 1902, and approved by the Chief of Engineers August 5, 1902. It proposed to expend the amount in redredging the channel for maintenance whenever it becomes necessary.

The total commerce of Flushing Bay and Creek since 1895 is reported as follows:

	Tons.		Tons.
1895.....	150,376	1900.....	177,575
1896.....	80,820	1901.....	200,473
1897.....	163,395	1902.....	155,450
1899.....	158,755		

The principal articles transported are coal, building materials, dye-woods, logwood extracts, and farm produce, amounting in value to about \$1,818,600. The vessels are steamers, tugs, sailing vessels, and barges, drawing from 6 to 14 feet when fully loaded. The total num-

ber of trips made last year was 1,418. About 45 per cent of the tonnage for 1902 passed up the creek above the bridge.

In my opinion Flushing Creek is worthy of improvement by the General Government, and I therefore report in favor of extending the channel to Irland Mills. If this view is concurred in by the Department, I would suggest that a survey be made, and that the sum of \$400 be allotted for the purpose. This survey will enable me to make an estimate for removing the dike, dredging the channel where necessary through the bay, and extending the channel to Irland Mills.

Very respectfully, your obedient servant,

S. M. MANSFIELD,  
*Colonel, Corps of Engineers.*

Brig. Gen. G. L. GILLESPIE,  
*Chief of Engineers, U. S. A.*

[First indorsement.]

OFFICE CHIEF OF ENGINEERS, U. S. ARMY,  
*February 14, 1903.*

Respectfully referred to the Board of Engineers for Rivers and Harbors constituted by Special Orders, No. 24, Headquarters, Corps of Engineers, series of 1902, for consideration and recommendation, as required by section 3 of the act of June 13, 1902.

Report of August 13, 1900, by Maj. E. H. Ruffner, Corps of Engineers, is herewith.

By command of Brig. Gen. Gillespie:

A. MACKENZIE,  
*Colonel, Corps of Engineers.*

[Second indorsement.]

BOARD OF ENGINEERS FOR RIVERS AND HARBORS,  
*Washington, D. C., March 11, 1903.*

Respectfully returned to the Chief of Engineers, United States Army.

The Board of Engineers for Rivers and Harbors has given due consideration to the within report of the district officer.

In the opinion of the Board the present and reasonably prospective commerce involved is such as to render this locality worthy of a moderate improvement, provided such improvement can be made at reasonable cost.

The Board therefore recommends that there be made an allotment of \$400 for a survey and estimate of cost, as recommended by the district officer.

For the Board:

H. F. HODGES,  
*Major, Corps of Engineers,*  
*Senior Member Present.*

[Third indorsement.]

OFFICE CHIEF OF ENGINEERS, U. S. ARMY,  
*March 14, 1903.*

Respectfully submitted to the Secretary of War.

This is a report on preliminary examination of Flushing Bay, New York, authorized by the river and harbor act of June 13, 1902.

Inviting attention to the report of the Board of Engineers for Rivers

and Harbors in the preceding indorsement, I recommend that a survey of the locality, as proposed, be authorized.

A. MACKENZIE,  
*Acting Chief of Engineers.*

[Fourth indorsement.]

WAR DEPARTMENT,  
*March 23, 1903.*

Approved as recommended by the Acting Chief of Engineers.

WM. CARY SANGER,  
*Assistant Secretary of War.*

[Tenth indorsement.]

BOARD OF ENGINEERS FOR RIVERS AND HARBORS,  
*Washington, D. C., December 1, 1904.*

Respectfully returned to the Chief of Engineers, United States Army.

The Board of Engineers for Rivers and Harbors has given consideration to the further reports of the district officer contained in eighth indorsement<sup>a</sup> hereon, and in an additional report, dated June 21, 1904, accompanying.

The existing project for the improvement of Flushing Bay, adopted March 3, 1879, and modified September 19, 1888, provides for making and maintaining a channel 6 feet deep and 200 feet wide at mean low water up to the lower bridge at Flushing, and for building a dike 4,663 feet long on the west side of the channel in Flushing Bay to protect it from filling. The estimated cost of the work was \$173,500. There had been expended up to June 30, 1903, \$122,540.53.

It was originally intended that the dike should create a tidal basin in the bay, and it was expected that by means of the flow and ebb of the tides a channel would be formed and maintained.

The original project was never fully carried out. Work was suspended on the dike in 1891 before its completion because of opposition by adjacent property owners. A gap of about 1,000 feet wide was left at the shore or upper end, and the outer 1,600 feet was only partially built. As a result of the incomplete work the object of providing a tidal basin was never fully effected. An examination of the map discloses an irregular channel of the projected depth, but of much less than the projected width.

The questions presented in the act of June 13, 1902, and now under consideration, are—

First. Shall the dike be repaired, completed, or removed?

Second. Shall the channel be extended to Irland Mills?

In second indorsement hereon the Board expressed the opinion that the commerce involved is such as to render this locality worthy of a moderate improvement, provided such improvement can be made at reasonable cost. The amount of commerce is reported as follows:

	Tons.		Tons.
1899 .....	158, 755	1901 .....	200, 473
1900 .....	177, 575	1902 .....	186, 000

amounting in value to about \$1,800,000 in 1902. Of this amount about 68,000 tons passes above the Broadway Bridge (the upper end of the present project) and about 34,000 tons passes above the Main Street Bridge. It appears, therefore, that the total traffic affected by the

improvement is considerable, but that only about 20 per cent of it applies to that portion of the river above the Main Street Bridge in the vicinity of Irland Mills, while about 40 per cent of it utilizes the stretch between the Broadway and Main Street bridges.

The district officer expresses the opinion that on account of the small amount of commerce passing above the Main Street Bridge and the slight desire evinced for an improved channel, he does not consider the improvement above that bridge desirable at this time.

With reference to the dike he expresses the opinion that it should be retained and modified, and that the channel should be extended to the Main Street Bridge with a width of 100 feet between the bridges. The estimated cost of this work, with the projected channel depth of 6 feet, is given at \$69,512.90.

After careful consideration the Board has arrived at the following conclusions:

The extension of the existing improvement to Irland Mills does not seem to be warranted either by present or prospective demands of commerce. The Board, however, is of the opinion that the projected 6-foot channel can advantageously be extended from the Broadway Bridge to the Main Street Bridge, though with a width of 100 feet instead of 200 feet between the bridges.

As to the dike, a study of the soundings and experience at other places tend to show that, except possibly at its inner (shore) end, it is not an essential part of the improvement. It does not appear, however, that at the present time the dike is a serious menace to navigation, and the Board therefore recommends that it be left as it is until it can be seen from further developments whether that part of the channel along the dike is maintained any better than that portion of the channel beyond the dike, and that then it be removed or repaired and extended, as developments may indicate best.

In view of what precedes, the Board recommends as desirable the further improvement of Flushing Bay, New York, by the United States, in accordance with a modified project which shall provide for a channel 200 feet wide and 6 feet deep at low water, from Long Island Sound to the Broadway Bridge, and for a channel of the same depth and 100 feet wide from the Broadway Bridge to the Main Street Bridge, by means of dredging, at an estimated cost of \$23,857.90, and that no work toward repairing, completing, or removing the dike be undertaken at present.

For the Board:

D. W. LOCKWOOD,  
*Lieut. Col., Corps of Engineers,*  
*Senior Member of the Board.*

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#### SURVEY OF FLUSHING BAY, NEW YORK.

UNITED STATES ENGINEER OFFICE,  
*New York, N. Y., June 21, 1904.*

GENERAL: I have the honor to submit the following report upon the survey of Flushing Bay and Creek. A preliminary report upon this locality was made by my predecessor, Col. S. M. Mansfield, Corps of Engineers (now brigadier-general, retired), in accordance with the

provisions in the river and harbor act of June 13, 1902, requiring a preliminary examination of Flushing Bay, with a view to repairing, completing, or removing the dike in said bay and extending the channel to Irland Mills.

The preliminary report of Colonel Mansfield was referred by the Chief of Engineers to the Board of Engineers for Rivers and Harbors, which, in an indorsement of March 11, 1903, stated:

In the opinion of the Board the present and reasonably prospective commerce involved is such as to render this locality worthy of a moderate improvement, provided such improvement can be made at reasonable cost.

The Board therefore recommends that there be made an allotment of \$400 for a survey and estimate of cost, as recommended by the district officer.

The action taken upon the above was the assignment to me of the duty of making a survey and estimate of cost of improvement, and allotting therefor the sum of \$400. In the letter<sup>a</sup> of the Chief of Engineers, dated March 26, 1903, assigning the duty to me, it was stated, after quoting the above opinion of the Board:

It is desired that your report be submitted in duplicate as required, and that it contain an expression of opinion, based upon the results of the survey, as to the extent of improvement at this locality justified by the commercial interests, present and prospective, involved.

The survey was placed under the supervision of First Lieut. J. R. Slattery, Corps of Engineers. Field work was carried on between the dates of May 23 and June 27, 1903, but owing to press of work and small force in this office, the plotting was delayed until late in the year.

The questions presented in the act of June 13, 1902, are: First, as to what should be done with the dike, and, second, should the channel (presumably the existing channel) be extended to Irland Mills? In the preliminary report of Colonel Mansfield, submitted before the survey was made, it was recommended that the dike be removed and the channel extended to Irland Mills. From the investigations and survey, I think it advisable that the dike should be retained, and modified; and, from the statement of Lieutenant Slattery of the small amount of commerce passing above the Main Street Bridge, and the slight desire evinced for an improved channel, I consider the question of improvement above that bridge as one that is not urgent at this time, and that might be left until a later date.

The map of the survey is transmitted herewith, and shows a channel having considerable variation in depths. Along the Flushing front the depths vary from 8.5 to 20 feet, and from the mouth of the creek to the end of the dike a narrow channel, with a central depth of 8 to 9 feet, is found, and this depth is decreased by a foot or two from the end of the dike to East River.

The estimate of cost of items referred to in paragraph 18 of Colonel Mansfield's report is as follows:

For removing dike .....	\$12,000.00
Dredging 6-foot channel, 200 feet wide, through the bay from East River to Broadway Bridge on the creek, 76,162 cubic yards, at 28 cents .....	21,325.36
Contingencies, 10 per cent .....	2,132.54
	23,457.90
Annual cost of maintenance.....	2,500.00

<sup>a</sup> Not printed.

Dredging 6-foot channel, 100 feet wide, lower bridge to Main Street	
Bridge, 1,212 cubic yards, at 30 cents .....	\$363. 60
Contingencies, 10 per cent .....	36. 40
	<hr/> 400. 00
Annual cost of maintenance .....	100. 00
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Dredging 6-foot channel, 100 feet wide, Main Street Bridge to Inland	
Mills, 10,981 cubic yards, at 30 cents .....	3, 294. 30
Contingencies, 10 per cent .....	329. 43
	<hr/> 3, 623. 73
Annual cost of maintenance .....	600. 00
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Total cost .....	39, 481. 63
Annual cost of maintenance .....	3, 200. 00

As heretofore stated, I do not recommend the removal of the dike nor the present extension of the channel improvement above Main Street Bridge.

The history of the improvement at this locality shows that the original plan of forming a tidal basin in the bay to produce a current through the bay channel was abandoned; and while the dike along a considerable part of the channel through the bay was constructed, it served as scarcely more than a guide for navigation, as the upper end was left at a distance of about 1,000 feet from the shore, thus permitting the flow of the tide coming out of the creek upon the ebb to be divided, much of it passing around the head of the dike, and thus greatly reducing the velocity along the channel side of the dike. Notwithstanding this, the dike has had some effect in keeping the water deep enough to make a well-defined channel.

An examination of the map shows that the tidal flow in the creek where the water is confined maintains a channel of considerably greater navigable capacity than that through the bay. There has been considerable opposition manifested heretofore to the presence of the dike by those not particularly interested in maintaining a channel into Flushing Creek. In order that I might learn just how much weight should be attached to this opposition, interviews were held with the owners found upon their property, and circular letters were addressed to all other owners of property on the bay shore whose addresses could be found (copies inclosed). But few replies have been received, and those that are unfavorable to the maintenance and extension of the dike are based on trivial grounds. The following synopsis shows the opinions expressed:

Name and locality.	Opinion.
A. M. Ryon, Flushing Creek.	Removal of dike would be a mistake, as velocity in channel is increased by dike.
Business Men's Association of Flushing.	Passed resolution, "The retention of the dike is the only means of keeping the channel from filling up." Wm. H. Kent, captain of steamer L. Boyer, the only boat making regular trips to Flushing, concurred in above resolution.
G. J. Talleur, Corona.....	I do not think the removal of the dike would be worth the money spent.
Harway Dyewood and Extract Manufacturing Co., Flushing.	Dike should be thoroughly repaired and lengthened at both ends.
C. W. Copp, Flushing.....	Should be either repaired or removed; no opinion as to which.
New York and Queens Electric Light and Power Co., Long Island City.	Dike should be extended and repaired or completed.
E. Platt Stratton, College Point.	Interest of all concerned will be best served by removal of dike, particularly the southern end, in order that a proper approach could be made to a proposed (not recently) bridge. Understood that the purpose of the dike had been abandoned.

Name and locality.	Opinion.
Dr. R. C. F. Combes, Corona..	Remove the dike as unsightly and of no account.
E. L. Baylies, Corona.....	Proposed extension would tend to increase the deposit of mud in the bay and interfere with bathing and boating.
Wm. A. Sands, Corona.....	Remove the dike as an injury to the bay, it having caused the bay to fill up.
P. J. Mara, Flushing .....	Do.
Thomas Skeuse, Flushing ...	Retain the dike to keep the mud now west of the dike out of the channel.
Louis Fisher, Corona.....	Opposes the extension; keeping the tide out of the bay would tend to increase the deposit of mud and interfere with his business of boat-building and keeping.
Fred Wenzel, Corona.....	Remove the dike, let the mud from the bay flow into the channel, dredge the channel, and so continue until the entire bay has been carried out by the dredging.
A. W. Pertsch, Corona .....	No objection to extension of dike southeastward.
Seawanhaka Boat Club, Corona.	No objection to extension of dike unless it would cause the western side of the bay to shallow.
C. L. Sicardi .....	(Representing the owners of 3,000 feet of water front on the west side of bay.) Withdraws all objection and favors the proposed improvement.

In my opinion, a dike through the bay is necessary for the maintenance of the channel, unless considerable dredging is to be repeated at short intervals, especially if this channel is to be made and maintained of sufficient depth to materially improve the commercial facilities of the region about the bay and creek. I therefore consider it advisable to thoroughly repair the dike, building it up to 1 foot above high water, and to extend it from the upper end to connect with the shore. This, with the dredging up to Main Street Bridge, would provide a channel 6 feet deep, 200 feet wide, through the bay, and 100 feet wide from lower bridge to Main Street Bridge, and I believe it would be fairly permanent, costing very little for maintenance.

The range of tide is about 7 feet, and it is believed that the velocity of flow, due to this variation of water level in filling and emptying twice each day the tidal basin of Flushing Creek, would maintain considerable depth in a confined channel through the bay.

The estimate of cost is:

Repairing and raising existing dike .....	\$31,655.00
Extending dike to the shore, 1,000 feet, at \$14 per linear foot .....	14,000.00
Dredging .....	23,857.90
Total .....	69,512.90

This work would perhaps accomplish all that would be properly included under the inquiry of Congress, but I am of the opinion that a deeper channel should be provided to meet the demands of the present and prospective commerce.

The instructions of the Chief of Engineers required an expression of opinion, based upon the results of the survey, as to the extent of improvement at this locality justified by the commercial interests, present and prospective, involved. The great growth of the city of New York, which now includes the shores of Flushing Bay and Creek, produces a constantly increasing demand for more facilities for handling water-borne commerce. The great value of water front along the older portions of the city makes it desirable for new enterprises to locate where it can be done at less expense. A channel with only 6 feet of depth does not present facilities for handling commerce in vessels of any considerable size.

In Lieutenant Slattery's report, two estimates are presented for improvement up to Main Street Bridge, one for a channel 100 feet

wide and 12 feet deep at mean low water from East River up to the Broadway Bridge, with a diminished channel of 100 feet width and 8 feet depth from Broadway Bridge to Main Street Bridge. The cost was estimated at \$87,204.87, and for maintenance \$6,000 per year. The second estimate was for a channel of same dimensions as above, except that the depth from East River to Broadway Bridge was reduced to 10 feet, the estimate of cost being \$41,653.83, and for maintenance \$4,000 per year. Including the repairing and extension of the dike the estimates would be:

For channel 100 feet wide, 12 feet deep at mean low water, to Broadway Bridge, and 8 feet deep from Broadway Bridge to Main Street Bridge:	
Dike work .....	\$45,655.00
Dredging .....	87,204.87
Total .....	<u>132,859.87</u>

For channel 100 feet wide, 10 feet deep at mean low water, to Broadway Bridge, and 8 feet deep from Broadway Bridge to Main Street Bridge:	
Dike work .....	45,655.00
Dredging .....	41,653.83
Total .....	<u>87,308.83</u>

With the dike modified as proposed, the maintenance of either channel to the end of the dike would be a matter of small annual cost, as the confined tidal flow would probably keep it pretty well scoured out. Some dredging would probably be required in the open bay from the end of the dike to East River, which I would estimate at about \$3,000 per annum. This could be largely reduced by extending the dike about 4,000 feet. The extension of the dike 4,000 feet at the lower end it is estimated would cost \$56,000, which, added to the above estimates, would require for a complete improvement for a 12-foot channel, \$188,859.87; for a 10-foot channel, \$143,308.83.

The establishment of a harbor line parallel to the dike, at a distance of 400 or 500 feet from it, would afford ample opportunity for numerous docks from College Point to Flushing.

Under present conditions it is my opinion that the extent of improvement at this locality, justified by the commercial interests involved, would be to make the 10-foot channel to Broadway Bridge, thence to Main Street Bridge an 8-foot channel, with modifications of dike, at the estimated cost of \$87,308.83, with a view to a future extension of the dike about 4,000 feet and deepening of channel to 12 feet up to the Broadway Bridge.

The report of Lieutenant Slattery is transmitted herewith.

Very respectfully, your obedient servant,

AMOS STICKNEY,  
*Colonel, Corps of Engineers.*

Brig. Gen. A. MACKENZIE,  
*Chief of Engineers, U. S. A.*

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REPORT OF LIEUT. J. R. SLATTERY, CORPS OF ENGINEERS.

UNITED STATES ENGINEER OFFICE,  
New York, N. Y., January 7, 1904.

COLONEL: I have the honor to report as follows on the survey of Flushing Bay and Creek:

2. The field work was limited to a survey of the creek and improved channel

through the bay. The map accompanying this report was compiled from the field notes of recent survey and maps on file in this office.

3. Flushing Bay is a shallow bay about 1 mile wide and 2 miles long, lying on the north side of Long Island, about 14 miles from the Battery, New York City. The bottom of the bay and creek is soft mud. The mean rise of the tide is 7.1 feet.

4. The first project for this improvement was adopted March 3, 1879, and an appropriation for the work was made. The project contemplated diking to form a large tidal basin and dredging a channel from the Broadway Bridge in Flushing to the 6-foot curve in the bay. This channel it was thought would be maintained by the flow of water from the tidal basin. The estimated cost was \$173,500. This project was subsequently modified in 1888, to omit a part of the diking, and again in 1891, when 4,663 feet of diking had been built, to omit all further diking and to count on maintaining the channel by dredging alone. A channel 8 feet deep and 100 feet wide was dredged with the view of obtaining a 6-foot channel. The 6-foot channel now varies in width from 50 to over 100 feet. Throughout its length there is a narrow channel with deeper water. A study of the soundings seems to indicate that the dike does not have any effect in maintaining the channel. The channel beyond the dike has maintained itself about as well as that part of channel along the dike. The creek consists of a series of pools separated by bars.

5. A channel 12 feet deep at mean low water and 100 feet wide, from the 12-foot curve in the Sound to the Broadway Bridge, and thence 8 feet deep and 100 feet wide to Irland Mills, would meet the present needs of nearly all business interests now using the bay and creek. The commerce, as reported in the annual reports of the Chief of Engineers, amounted to 158,755 tons in 1899, 177,575 tons in 1900, 200,473 tons in 1901, and 186,000 tons in 1902. From inquiries made of all interested parties whom I could find, I should estimate the commerce in the creek above the Broadway Bridge at about 68,000 tons. Only about half of this amount passes up beyond the Main Street Bridge. I do not consider that the small amount of commerce passing above the Main Street Bridge warrants the improvement being carried above that point. The desire for the improvement beyond this point is slight, and what desire there is is based more on the hope of causing factories to locate there than on any present actual needs. As there still remains plenty of room for factories below this point, I believe that the improvement between Main Street Bridge and Irland Mills should not be undertaken at the present time.

6. The following estimate is for a channel 12 feet deep and 100 feet wide, at mean low water, from the 12-foot curve in the Sound to the Broadway Bridge, and a channel 8 feet deep and 100 feet wide, at mean low water, thence to the Main Street Bridge.

For the removal of 276,192 cubic yards of mud between the 12-foot curve in Sound and the Broadway Bridge, at 28 cents.....	\$77,333.76
For the removal of 6,478 cubic yards of mud between the Broadway and Main Street bridges, at 30 cents.....	1,943.40
Contingencies, 10 per cent .....	7,927.71
<b>Total .....</b>	<b>87,204.87</b>
For maintenance, \$6,000 per year.	

7. This seems to be quite the maximum limit to which the locality is now worthy of improvement by the United States.

8. To continue the 8-foot channel to Irland Mills would necessitate the removal of 27,159 cubic yards of mud in addition to the amounts above estimated. The cost of removing this is estimated at \$8,962.47. The total estimate for carrying the improvement to this point is, therefore, \$96,167.34.

9. The cost of the removal of the dike is estimated at \$12,000.

10. While a study of the channel seems to indicate that the dike does not serve in the least to maintain the channel, I would recommend that for the present it be left as it is (being lighted and buoyed so as not to endanger navigation) until it can be seen from further developments whether that part of the channel along the dike is maintained any better than that portion of the channel beyond the dike, and that then it be removed or repaired and extended as developments may indicate best.

11. A channel 10 feet deep and 100 feet wide up to the Broadway Bridge, and thence 8 feet deep and 100 feet wide up to the Main Street Bridge, would meet the present needs of most of the interested concerns. It, however, would fail to meet the needs of the Harway Dyewood and Extract Company, which appears to be one of the concerns that make the greatest use of the improvement.

12. The following is the estimated cost of the channel described in paragraph 11:

For removing 128,299 cubic yards of mud between the 10-foot curve in Sound and the Broadway Bridge, at 28 cents .....	\$35, 923. 72
For removing 6,478 cubic yards of mud between Broadway and Main Street bridges, at 30 cents .....	1, 943. 40
	<hr/>
	37, 867. 12
Contingencies, 10 per cent .....	3, 786. 71
	<hr/>
Total .....	41, 653. 83

Maintenance, \$4,000 per year.

13. If continuing contracts should be authorized for entire work, the above estimates could be reduced 10 per cent.

Very respectfully, your obedient servant,

J. R. SLATTERY,  
*First Lieut., Corps of Engineers.*

Col. AMOS STICKNEY,  
*Corps of Engineers, U. S. Army.*

CIRCULAR LETTERS ADDRESSED TO CERTAIN RIPARIAN OWNERS ALONG THE LINE OF THE PROPOSED IMPROVEMENT.

(A.)

UNITED STATES ENGINEER OFFICE,  
*New York City, August 22, 1903.*

SIR: The question as to the further improvement of Flushing Bay and the continuation of the improvement up to Irland Mills, and the repair or removal of the breakwater, is about to be taken up in this office. Will you please favor me with your opinion as to what further improvement, if any, is needed, what depth and width of channel is needed, to what point the improvement should be carried, and what amount of commerce would be benefited thereby.

An early reply is requested.

Very respectfully,

J. R. SLATTERY,  
*First Lieut., Corps of Engineers.*

(B.)

UNITED STATES ENGINEER OFFICE,  
*New York City, May 6, 1904.*

SIR: A project is under consideration by this office for the extension of the dike in Flushing Bay southeastward to join the shore.

The object of this is to confine the tidal flow into and out of Flushing Creek to the navigable channel through the bay to assist in maintaining the depth, which under present conditions constantly deteriorates.

Please inform me if you know of any valid objection to such extension of the dike which ought to weigh against the maintenance of the channel.

Very respectfully,

AMOS STICKNEY,  
*Colonel, Corps of Engineers.*

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SURVEY OF  
**FLUSHING BAY AND CREEK, N.Y.**

From  
**COLLEGE POINT TO IRLAND MILLS.**

Made under direction of  
Colonel Amos Stickney, Corps of Engineers, U.S.A.

And supervision of Lieut. J.R. Slattery, Corps of Engineers, U.S.A.,  
by W.E. Preston, Junior Engineer.

May 23-June 27, 1903, supplemented from previous surveys.

SCALE:





# FLUSHING BAY



OVLC 11237

Box 92